equally true of celestial as of terrestrial bodies, and when the light of the sun or of a star is projected on the slit of a spectroscope, we have at once an unfailing and accurate criterion as to the elements present in the atmosphere of the sun or star.

When we analyse the light of the sun in this way we find lines in its spectrum due to most of the terrestrial elements, and, as we have good grounds for believing that earth and sun had a common origin, we can safely assume that their composition is identical, and that, if some terrestrial elements do not show in the solar spectrum, it is either on account of their relative scarcity, or because their spectrum is weak and overpowered by others. On the other hand there is no convincing evidence of the presence in the sun of any elements not found on the earth, although this was not the case a few years ago. There is always present in the spectrum of the outer atmosphere of the sun a very bright yellow line of which there was no known terrestrial counterpart and the hypothetical gas producing this line was called helium. Sir Wm. Ramsay, in 1895, in examining the spectrum of a gas, obtained by heating a rare mineral called cleveite, found that it gave a strong line in exactly the same position as the yellow solar line and was consequently due to the same element, helium. Helium is a very light gas, does not combine with any other elements, and has not sufficient mass to enable the earth's attraction to retain it in the atmosphere. Consequently most of the helium, except that occluded by the mineral cleveite and, as we now know, that obtained from the degradation of radium had dissipated into space. This is an interesting incident, and as will be seen later a very important and widespread one—a new element discovered in the sun before being found on the earth.

Although we might possibly have reasoned from other evidence of the probable identity of composition of the sun and earth, we certainly could not, without the spectroscope, have known anything definite of the constitution and physical condition of the stars. When, however, we examine their spectra we find nearly forty per cent. of them practically identical with the sun, and the remainder shading off by gradual degrees into simpler and simpler spectra until only the lines due to hydrogen and to hydrogen and helium remain. The disappearance of the lines of the heavier elements is not, however, an indication that they are not present, but only that, owing to the higher temperature of the hydrogen and helium stars these light elements are the chief constituents of their outer atmospheres and the elements of higher atomic weight are nearer the centre.

The evidence then, spectroscopic and otherwise, of the chemical unity of all the matter in the universe is indisputable.